CLAIMS:

1. A cardiac assist device, comprising:

a primary device housing;

a sensor to sense conditions of a heart; and

a lead system to transmit and receive signals between the heart and said primary housing;

said primary device housing including,

a control circuit, in operative communication with said sensor, to control generation of various electrical stimuli in response to sense conditions of the heart,

a chaos control generator to generate an electrical signal so as to bring a pre-fibrillated heart condition back into a normal beating condition when said control circuit determines from the sensed conditions a pre-state of fibrillation, and

a pacing environment enhancement generator to generating an electrical enhancement signal that causes a threshold of pacing cells in the heart to be exceeded in response to a subthreshold stimulus when control circuit determines from the sensed conditions a subthreshold pacing signal.

2. The cardiac assist device as claimed in claim 1, wherein said electrical enhancement signal comprises a noise signal.

3. The cardiac assist device as claimed in claim 1, wherein said electrical enhancement signal comprises a periodic signal.

4. The cardiac assist device as claimed in claim 1, wherein said electrical enhancement signal comprises a high frequency deterministic signal.

5. The cardiac assist device as claimed in claim 1, wherein said electrical enhancement signal comprises a randomly fluctuating intensity signal.

6. The cardiac assist device as claimed in claim 1, wherein said electrical enhancement signal comprises a randomly fluctuating frequency signal.

7. The cardiac assist device as claimed in claim 1, wherein said electrical enhancement signal is modulated in response to the sensed subthreshold pacing signal.

8. The cardiac assist device as claimed in claim 1, wherein said sensor comprises a two-dimensional high resolution touch sensitive patch attached to the heart to provide fast frames of pressure readings from a two-dimensional array of individual pressure sites.

9. The cardiac assist device as claimed in claim 1, wherein said sensor comprises a two-dimensional high resolution patch to measure, capacitively, a voltage waveform traveling across the heart.

10. The cardiac assist device as claimed in claim 9, wherein said two-dimensional high resolution patch comprises a two-dimensional array of individual non-destructive floating-gate charge-sensing amplifiers.

11. The cardiac assist device as claimed in claim 1, wherein said primary device housing further includes a defibrillation circuit to generate a electrical pulse so as to defibrillate a fibrillated heart when said control circuit determines from the sensed conditions a state of fibrillation.

12. The cardiac assist device as claimed in claim 1, wherein said lead system comprises a fiber optic based communication system.

13. The cardiac assist device as claimed in claim 1, wherein said lead system comprises a plurality of electrical leads.

14. The cardiac assist device as claimed in claim 13, wherein said plurality of electrical leads have a shielding therearound, said shielding preventing said electrical leads from conducting stray electromagnetic interference.

15. The cardiac assist device as claimed in claim 14, wherein said shielding is a metallic sheath to prevent said electrical leads from conducting stray electromagnetic interference.

16. The cardiac assist device as claimed in claim 14, wherein said shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

17. The cardiac assist device as claimed in claim 14, wherein said shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

18. The cardiac assist device as claimed in claim 13, wherein each electrical lead includes an electrical filter, said electrical filter removing stray electromagnetic interference from a signal being received from said electrical lead.

19. The cardiac assist device as claimed in claim 18, wherein said plurality of electrical leads have a shielding therearound, said shielding preventing said electrical leads from conducting stray electromagnetic interference.

20. The cardiac assist device as claimed in claim 19, wherein said shielding is a carbon composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

21. The cardiac assist device as claimed in claim 19, wherein said shielding is a polymer composite sheath to prevent said electrical leads from conducting stray electromagnetic interference.

22. A method for assisting a heart beat normally, comprising:

(a) sensing conditions of a heart;

(b) determining a state of the heart from the sensed conditions;

(c) generating a control electrical signal so as to bring a pre-fibrillated heart condition back into a normal beating condition when the determined state of the heart is a pre-state of fibrillation, and

(d) generating an electrical enhancement signal that causes a threshold of pacing cells in the heart to be exceeded in response to a subthreshold stimulus when the determined state of the heart is a state associated with a subthreshold pacing signal.

23. The method as claimed in claim 22, wherein the electrical enhancement signal comprises a noise signal.

24. The method as claimed in claim 22, wherein the electrical enhancement signal comprises a periodic signal.

25. The method as claimed in claim 22, wherein the electrical enhancement signal comprises a high frequency deterministic signal.

26. The method as claimed in claim 22, wherein the electrical enhancement signal comprises a randomly fluctuating intensity signal.

27. The method as claimed in claim 22, wherein the electrical enhancement signal comprises a randomly fluctuating frequency signal.

28. The method as claimed in claim 22, wherein the electrical enhancement signal is modulated in response to the sensed subthreshold pacing signal.

29. The method as claimed in claim 22, wherein the conditions of the heart are sensed by measuring pressure waves upon a surface of the heart.

30. The method as claimed in claim 22, wherein the conditions of the heart are sensed by capacitively measuring a voltage waveform traveling across the heart.

31. The method as claimed in claim 22, further comprising:

(e) generating a electrical pulse so as to defibrillate a fibrillated heart when the determined state of the heart is a state of fibrillation;